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(54) Title: FACIAL COSMETIC

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### Specification

#### 1. Title of the Invention FACIAL COSMETIC

#### 2. Claims

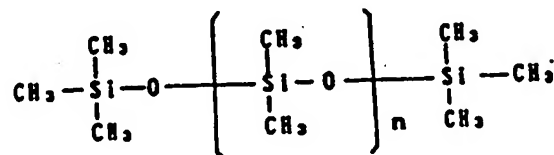
Facial cosmetic characterized by the fact that it contains 1-70 percent by weight of the organic silicone resin described in (A) hereinbelow, 10-98 percent by weight of the volatile silicone oil described by (B) hereinbelow, and 0.5-55 percent by weight of powder.

(A) Organic silicone resin characterized by the fact that it consists of at least 70 percent by mole of  $R_3\text{SiO}_{1/2}$  units and  $\text{SiO}_2$  units, present at a molar ratio of from 0.5/1 to 1.5/1, and 1-30 percent by weight of  $R_2\text{SiO}$  units and/or  $\text{RSiO}_{3/2}$  units.

(R denotes a hydrocarbon or phenyl group with 1 to 6 carbon atoms.)

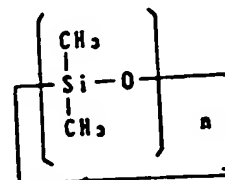
(B) At least one of the volatile silicone oils described by general formula (I) and general formula (II)

General formula (I)



(where  $n$  is an integer ranging from 0 to 5.)

General formula (II)



(where  $n$  is an integer ranging in value from 3 to 7.)

### 3. Detailed Description of the Invention [Industrial Field of Application]

The present invention relates to facial cosmetics. More specifically, it relates to facial cosmetics that show good moisture resistance, perspiration resistance, and oil resistance and are long lasting and stable.

What is meant by the term facial cosmetic in the present invention comprises undercoats as well as conventional makeup.  
[Prior Art]

There are various forms of facial cosmetics including solid foundations, solid eye shadows, oily foundations, and lipsticks, all of which consist of powder and oil. There are also emulsion-type foundations and other facial cosmetics, based on emulsion systems, all of which are characterized by the fact that they contain large amounts inorganic powders such as talc, kaolin, red iron oxide, titanium oxide, and titanium-mica pearlescent pigments and organic pigments such as nylon, cellulose, and tar pigments.

#### [Problems To Be Solved by the Invention]

Such facial cosmetics are subject to spotting, running, and the like from the action of sebum, perspiration, or the oils in other cosmetics. Women are universally dissatisfied with such running and splotchiness, especially in the hot and humid conditions of summer, and improvement is desired.

Cosmetic undercoats are used to improve the spreading qualities and finish of facial cosmetics, but little attention has been given to their lasting qualities.

Japanese Unexamined Patent Application Tokkai No. Sho 61-18708 discloses a method of blending silicone resin in order to prevent running and splotchiness. This silicone resin is made by hydrolyzing organic trichlorosiloxane and organic dichlorosiloxane, and then condensing and cross-linking them, and as a result it has low molecular weight, is sticky, and does not afford sufficient prevention of running and splotchiness. Attempts have been made to prevent running and splotchiness by increasing the degree of polymerization (creating a three-dimensional cross-linked structure) until the resin is no longer sticky. However, products made from these resins show poor stability, especially at high temperatures, because the resins dissolve poorly in cosmetic oils, silicone oil, and the like, are unstable, ultimately becoming insoluble, and cross-link further over time. Japanese Patent Application No. Sho 59-187139 discloses the use of a silicone resin consisting of  $R_3SiO_{1/2}$  and  $SiO_2$  units, but this makeup also has poor durability: the film formed on the skin is too hard and cracks over time.

#### [Means of Solving the Problems]

In view of this situation, the present inventors devoted serious study to obtaining a facial cosmetic which affords excellent prevention of running and splotchiness. As a result, they discovered that a facial cosmetic with a refreshing feel, good spreading qualities, and the ability to prevent running and splotchiness can be obtained by using a specific organic silicone resin together with a volatile silicone oil and then adding powder to the mixture, leading to the present invention.

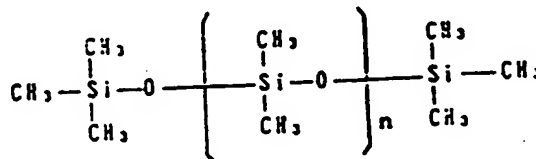
Thus, the present invention is a facial cosmetic characterized by the fact that it contains 1-70 percent by weight of the organic silicone resin described in (A) hereinbelow, 10-98 percent by weight of the volatile silicone oil described by (B) hereinbelow, and 0.5-55 percent by weight of powder.

(A) Organic silicone resin characterized by the fact that it consists of at least 70 percent by mole of  $R_3SiO_{1/2}$  units and  $SiO_2$  units, present at a molar ratio of from 0.5/1 to 1.5/1, and 1-30 percent by weight of  $R_2SiO$  units and/or  $RSiO_{3/2}$  units.

(R denotes a hydrocarbon or phenyl group with 1 to 6 carbon atoms.)

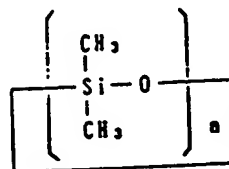
(B) At least one of the volatile silicone oils described by general formula (I) and general formula (II)

General formula (I)



(where  $n$  is an integer ranging from 0 to 5.)

General formula (II)



(where  $n$  is an integer ranging in value from 3 to 7.)

The organic silicone resin (A) used in the present invention can be obtained easily by mixing suitable conventional silanes, diluting with a solvent such as toluene or hexane, and then heating to polymerize the constituents. The same type of silicone resin can be obtained using water glass instead of a silane as the  $\text{SiO}_2$  unit.

The straight-chain and cyclic silicone oils respectively described by general formulas (I) and (II), hereinabove, used in the present invention, are volatile and can be used as solvents for the above-mentioned organic silicone resin.

The powder used in the present invention may be any powder conventionally used in facial cosmetics, including inorganic powders such as talc, mica, kaolin, calcium carbonate, China white, titanium dioxide, red iron oxide, yellow iron oxide, black iron oxide, ultramarine blue, Prussian blue, chromium hydroxide, bismuth oxychloride, and titanium-mica pearlescent pigments; organic powders such as red No. 201, red No. 202, yellow No. 5, aluminum lakes [sic, possibly yellow No. 5 aluminum lake], and blue No. 2 aluminum lake; resin powders such as nylon, cellulose, and polyethylene; and metal soaps.

Suitable mixing ratios for the essential components are as follows.

The organic silicone resin is used in amounts ranging from 1 to 70 percent by weight of the entire facial cosmetic, the volatile silicone oil, in amounts ranging from 10 to 98 percent by weight of the facial cosmetic, and the powder, in amounts ranging from 0.5 to 55 percent by weight of the facial cosmetic.

Obviously, water-in-oil or oil-in-water emulsified facial cosmetics which retain the ability to prevent running and splotchiness can be obtained with emulsion techniques in which water-soluble components and suitable surface-active agents are used in addition to the essential components named hereinabove.

In addition to the substances mentioned hereinabove, oils, waxes, medicaments, fragrances, or other volatile components may be used in the facial cosmetic of the present invention in amounts that do not quantitatively or qualitatively compromise the effect of the invention.

The present invention is described in further detail hereinbelow by means of working examples. The present invention is not limited by these examples. Mixing proportions are given as percentages by weight.

#### Working Example 1 Oily Foundation

(1) Kaolin	25.0%
(2) Titanium dioxide	15.0
(3) Iron oxide	3.0

(4) Microcrystalline wax	4.0
(5) Liquid paraffin	5.0
(6) Sorbitan sesquiolate	1.0
(7) Octamethylcyclotetrasiloxane (In general formula (II), $n = 4$ )	Balance
(8) Organic silicone resin where $(\text{CH}_3)_2\text{SiO}_{1/2}/\text{SiO}_2/(\text{CH}_3)_2\text{SiO}$ $= 2.4/1.6/1.0$	2.0
(9) Fragrance	As appropriate

(4)-(8) were melted by stirring at 70-80°C, and then (1)-(3) were added and dispersed. The mixture was deaerated, (9) was added, and suitable containers were filled with the mixture to obtain oily foundation.

The oily foundation of Working Example 1 was moisture resistant, oil resistant, and perspiration resistant, showed little running or splotchiness, and had a refreshing feel on the skin. The product was also stable when stored for 1 mo at 50°C, showing no coagulation, separation, or increase in viscosity.

#### Comparative Example 1 Oily Foundation

(1) Kaolin	25.0%
(2) Titanium dioxide	15.0
(3) Iron oxide	3.0
(4) Microcrystalline wax	4.0
(5) Liquid paraffin	5.0
(6) Sorbitan sesquiolate	1.0
(7) Ethyl hydroxyethyl cellulose	10.0
(8) Ethyl alcohol	10.0
(9) Volatile isoparaffin (Boiling point 116-143°C)	Balance
(10) Fragrance	As appropriate

(7) and (8) were melted by stirring at 70-80°C and dispersed in (9). (4)-(6) were added and melted by heating, (1)-(3) were added and uniformly dispersed, and the mixture was deaerated.

(10) was added, and the mixture was stirred and packaged in suitable containers to obtain oily foundation.

Working Example 1 and Comparative Example 1 were subjected to the following evaluation.

Filter paper was impregnated with water or squalene. Working Example 1 and Comparative Example 1 were applied to the papers, and pressure from a dry nylon sheet was applied 10 times with a vertical motion. When this procedure was

completed, the amount of the sample transferred from the nylon sheet to the filter paper [sic] was determined by evaluating the darkness of the color visually.

[Scoring System]

- 1 No transference.
- 2 Slight transference.
- 3 Marked transference.

The results, shown in Table 1, are the mean values from five testing cycles.

Table 1

	water	Squalene
Working Example 1	1.0	1.0
Comparative Example 1	2.2	2.8

The results show that the facial cosmetic obtained in Working Example 1 resisted sloughing off with water and squalene: i.e., it has better lasting qualities, moisture resistance, and oil resistance than Comparative Example 1, a prior art oily foundation with good lasting qualities.

#### Working Example 2 Liquid Lipstick

- |  |                |
|--|----------------|
| (1) Dimethylpolysiloxane 0.65 CS<br>(In general formula (I), $n = 0$ )   | 20.0           |
| (2) Dimethylpolysiloxane 2.0 CS<br>(In general formula (I), $n = 3$ )  | 20.0           |
| (3) Organic silicone resin where<br>$(CH_3)_3SiO_{1/2}/SiO_2/(CH_3)_2SiO/(C_6H_5)_2SiO_{3/2} =$<br>1.6/3.1/1.0/1.0 | 40.0           |
| (4) Glyceryl triisostearate  | 10.0           |
| (5) Red No. 226  | 10.0           |
| (6) Fragrance  | As appropriate |

(1)-(3) were melted by stirring at 70-80°C. In a separate operation, (4) and (5) were worked with a roller, then added to the other components, and dispersed. The mixture was deaerated, and (6) was added to obtain liquid lipstick.

The liquid lipstick obtained in Working Example 2 showed

good moisture resistance, oil resistance, perspiration resistance, and little spotting or running due to adhesion to drinking utensils or the like. The product had a refreshing feel on the skin. The product was also stable when stored for 1 mo at 50°C, showing no coagulation, separation, or increase in viscosity.

#### Working Example 3 Mascara

- |  |                |
|--|----------------|
| (1) Dimethylpolysiloxane, 1.5 CS<br>(In general formulation (I), $n = 2$ )                 | 4.5%           |
| (2) Octamethylcyclotetrasiloxane<br>(In general formula (II), $n = 4$ )                    | 10.0           |
| (3) Organic silicone oil where<br>$(CH_3)_3SiO_{1/2}/SiO_2/(CH_3)_2SiO_{3/2} =$<br>44/55/1 | 70.0           |
| (4) Black iron oxide   | 15.0           |
| (5) POE (20) sorbitan monolaurate  | 0.5            |
| (6) Fragrance  | As appropriate |

(1)-(3) were melted by stirring at 70-80°C, and (4) and (5) were added and dispersed. The mixture was deaerated, and (6) was added to obtain mascara.

The mascara of Working Example 3 showed little running due to tears or the like and did not stick to the eyelids.

The product was also stable when stored for 1 mo at 50°C, showing no coagulation, separation, or increase in viscosity.

#### Working Example 4 Cosmetic Undercoat

- |   |                |
|---|----------------|
| (1) Kaolin  | 10.0%          |
| (2) Titanium dioxide  | 5.0            |
| (3) Red iron oxide  | 0.3            |
| (4) Yellow iron oxide   | 0.2            |
| (5) Methylphenylpolysiloxane<br>( $n = 100$ )   | 20.0           |
| (6) Dimethylpolysiloxane, 2 CS<br>(In general formula (I), $n = 3$ )  | 10.0           |
| (7) Solid paraffin  | 5.0            |
| (8) Microcrystalline wax  | 4.0            |
| (9) Sorbitan sesquioleate   | 1.0            |
| (10) Organic silicone resin where<br>$(CH_3)_3SiO_{1/2}/SiO_2/(CH_3)_2SiO/(CH_3)_2SiO_{3/2} =$<br>15/15/2.5/1.0 | 2.0            |
| (11) Decamethylcyclopentasiloxane<br>(In general formula (II), $n = 5$ )  | 24.5           |
| (12) Fragrance  | As appropriate |

(1)-(4) were mixed and reduced to powder. In a separate

operation, (5)-(11) were mixed and melted at 70-80°C. The two mixtures were stirred together and deaerated, and (12) was added to obtain a cosmetic undercoat.

The cosmetic undercoat of Working Example 4 improved the spreading qualities of facial cosmetic applied on top of it and suppressed spotting and running. The product was also stable when stored for 1 mo at 50°C, showing no coagulation, separation, or increase in viscosity.

#### Working Example 5 Highlighter

(1) Decamethylcyclopentasiloxane (In general formula (II), $n = 5$ )	95.0%
(2) Organic silicone resin where $(CH_3)_3SiO_{1/2}/SiO_2/(CH_3)_2SiO$ $= 2.25/1.75/1.0$	4.3
(3) Titanium-mica pearlescent pigment	0.5
(4) Fragrance	As appropriate

(1) and (2) were melted by heating, and (3) and (4) were added and dispersed to obtain highlighter.

The product was also stable when stored for 1 mo at 50°C, showing no coagulation, separation, or increase in viscosity.

#### [Effect of the Invention]

The facial cosmetic of the invention shows good moisture resistance, perspiration resistance, and oil resistance, good stability, and little running or splotchiness. It also spreads well and has a refreshing feel on the skin.

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